

## CLAIMS

1. A vector for secretory expression of an intact MK family protein by methylotrophic yeast, said vector comprising a gene encoding a mature MK family protein ligated to a signal sequence of  $\alpha 1$  factor derived from *Saccharomyces cerevisiae*.  
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2. The vector according to claim 1 comprising components (a) to (g) below:
  - (a) a promoter sequence of a methanol-inducible alcohol oxidase gene (AOX1) derived from *Pichia pastoris*,
  - 10 (b) a signal sequence of  $\alpha 1$  factor derived from *Saccharomyces cerevisiae*,
  - (c) a gene encoding a mature MK family protein, wherein said gene is ligated to (b),
  - (d) a transcription termination sequence of a methanol-inducible alcohol oxidase gene (AOX1) derived from *Pichia pastoris*,
  - 15 (e) a selection marker gene functioning in *Escherichia coli* and methylotrophic yeast,
  - (f) a replication origin functioning in *Escherichia coli*, and
  - (g) 5' AOX1 and 3' AOX1 for the site-specific homologous recombination to a methylotrophic yeast chromosomal DNA.
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3. The vector according to claim 1, wherein said MK family protein is MK protein.
4. The vector according to claim 1, wherein said MK family protein is PTN protein.
- 25 5. A transformant comprising methylotrophic yeast transformed with the vector according to any one of claims 1 to 4.
6. The transformant according to claim 5, wherein said transformant is pPIC9DP-hMK/SMD1168, said vector is the one according to claim 3, and said methylotrophic yeast is strain SMD1168.
- 30 7. The transformant according to claim 5, wherein said transformant is pPIC9-hPTN/GS115, said vector is the one according to claim 4, and methylotrophic yeast is strain GS115.
8. A method for producing an intact MK family protein, said method comprising culturing the transformant according to any one of claims 5 to 7 and recovering secretory expression products.
- 35 9. The method according to claim 8, said method comprising:

- 5 (11)  
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- (a) culturing the transformant according to claim 6,  
(b) inducing the expression of MK protein under the conditions of  
20°C and pH 3 after the proliferation at pH 4, and  
(c) recovering secretory expression products.

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